Complete Summary

GUIDELINE TITLE

Parenteral nutrition administration. In: Safe practices for parenteral nutrition.

BIBLIOGRAPHIC SOURCE(S)

Mirtallo J, Canada T, Johnson D, Kumpf V, Petersen C, Sacks G, Seres D, Guenter P, Task Force for the Revision of Safe Practices for Parenteral Nutrition. Parenteral nutrition administration. In: Safe practices for parenteral nutrition. JPEN J Parenter Enteral Nutr 2004 Nov-Dec;28(6):S65-70. [32 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Conditions and disease states requiring parenteral nutrition

GUIDELINE CATEGORY

Management
Technology Assessment

CLINICAL SPECIALTY

Family Practice
Geriatrics
Internal Medicine

Nursing
Nutrition
Pediatrics
Pharmacology

INTENDED USERS

Advanced Practice Nurses
Dietitians
Hospitals
Nurses
Pharmacists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To provide guidelines with supporting evidence to foster quality parenteral nutrition (PN) therapy
- To reduce errors and improve safety in patients receiving parental nutrition
- To address concepts pertinent to safe administration of PN

TARGET POPULATION

Adult and pediatric patients receiving parental nutrition

INTERVENTIONS AND PRACTICES CONSIDERED

1. Administration of parenteral nutrition (PN) via a central venous access catheter (CVC)
2. Confirmation of proper CVC tip placement
3. Care and maintenance of venous catheters
4. Selection of equipment used to administer PN formulations
5. Filter size and filter replacement
6. Correct use of Infusion pumps and administration sets
7. Use of di (2-ethylhexyl) phthalate (DEHP) free administration sets
8. Use of medical devices that minimize needle stick injury
9. Review of patient identity and PN label and PN visual inspection prior to administration
10. Time for completion of PN infusions
11. Patient monitoring during PN infusions
12. Policy for use of PN prepared by another facility

Note: The use of femoral catheters was considered but not recommended.

MAJOR OUTCOMES CONSIDERED

Frequency, severity, and type of complications that could result from parenteral nutrition therapy administration

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The Task Force reviewed existing published literature in electronic databases and secondary source literature on order writing practices for parenteral nutrition.

Because clinical guidelines cannot be based solely on prospective randomized trials, the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Task Force for Revision of Safe Practices for Parenteral Nutrition conducted the 2003 Survey of Parenteral Nutrition (PN) Practices, focusing on policies and procedures relating to ordering, compounding, and administering PN and quality oversight of this process (see "Availability of Companion Documents" field). The final document published as "Safe Practices for Parenteral Nutrition" was based primarily on the recommendations of experts in the field and was evidence-based for as much as the literature provided evidence to support these recommendations. The results from this survey were used as a basis for the revised "Safe Practices for Parenteral Nutrition" to enhance the quality and efficacy of nutrition support.

Development of the Survey Instrument

One of the survey objectives was to identify common practices related to ordering and compounding, administration of PN, and quality oversight of this process. A questionnaire based upon the existing A.S.P.E.N. "Safe Practices for Parenteral Nutrition" was developed to obtain an overview of the variance and consistency with current practices from a variety of healthcare settings. It was designed to include both hospital- and non-hospital-based PN practices. The survey instrument was not tested or validated before its distribution, but it was reviewed by a multidisciplinary panel of nutrition support practitioners and revised before becoming available for participant responses. The survey was administered electronically through the A.S.P.E.N. website and announced to the membership via society journals and A.S.P.E.N. list servers. Announcements inviting participation were also sent to selected professional groups, including the American College of Clinical Pharmacy, the American Society of Health-System Pharmacists, the National Home Infusion Association, and others. Participation in the survey was completely voluntary. The survey instrument consisted of 45 questions with multiple-choice and free-text responses. It was organized into 5 sections: demographics of the respondent, writing PN orders, computer order entry of PN orders, problems with PN orders, and adverse events related to PN. Questions in the demographic section focused on information such as professional background (i.e., MD, RN, RD, RPh, other) and primary practice setting (i.e., hospital, homecare, etc). The order writing section was designed to identify the discipline responsible for writing PN orders, whether or not standard PN order forms were used, and the manner in which PN components were ordered (i.e., dextrose in percent final concentration vs g/day, electrolytes in mEq/L vs per day,

etc). The computer order entry section was designed to quantitate the use of computerized order entry systems and automated compounding devices. The final 2 sections, problems and adverse events related to PN, were developed to capture the type and frequency of harm associated with the compounding and administration of PN formulations.

Data Collection

The survey was announced on the A.S.P.E.N. website, in the society journals (e.g., *Journal of Parenteral and Enteral Nutrition*, *Nutrition in Clinical Practice*), and list servers (e.g., ASPENet) between June 1 and 30, 2003. Messages were subsequently posted to inform potential respondents of the deadline for final submission of survey responses. Participants were assured that their responses would be confidential and that only aggregate responses would be reported.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Data Analysis

Descriptive statistics were used to characterize the frequencies of surveyed practices. Questions with free text responses were analyzed for content to determine if the responses were significant to the study. Data were analyzed with the SPSS 11.5 (SPSS, Inc, Chicago, IL) statistical package. Frequency data were assessed with chi-squared. The *a priori* level of significance was set at ≤ 0.05.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Realizing that the original Safe Practice guidelines were not consistently implemented, the Task Force used this information to identify practices pertinent to the revision of the Safe Practice guidelines. The survey results presented in this document are those findings pertinent to the development of the guideline. This snapshot of current practices and expert opinion or consensus provided by both external and internal reviews was compiled into the current Safe Practices.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

This document was internally reviewed by the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Standards Committee as well as the Dietetic, Nursing, Medical, and Pharmacy Practice Sections and approved by the A.S.P.E.N. Board of Directors after external review by individuals and other associations of health care professionals. A.S.P.E.N. recognizes that the practice guidelines will have broad ramifications in changing clinical practice in many health care settings for pharmacists, physicians, nurses, dietitians, and technical support personnel. It is hoped that these guidelines will be accepted and used to prevent future patient harm, and will serve as a catalyst for future research.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

1. Central parenteral nutrition (PN) is administered via a central venous access catheter (CVC) with the distal tip placed in the superior vena cava adjacent to the right atrium.
2. The use of femoral catheters for PN administration should be avoided.
3. Proper CVC tip placement shall be confirmed prior to initial PN administration and/or any other time signs/symptoms indicate an improper catheter position. Proper CVC tip placement shall also be confirmed/validated in the pediatric patient when there has been significant growth.
4. Care and maintain venous catheters used for PN according to published standards.
5. Equipment used to administer PN formulations shall be selected based on the safest mode of delivery for both the patient and the healthcare provider.
6. A 1.2 micron filter may be used for all PN formulations. Alternatively a 0.22 micron filter may be used for 2-in-1 formulations.

7. A filter that clogs during PN infusion may be indicative of a problem and may be replaced but shall never be removed.
8. PN final containers and administration sets shall be free of the plasticizer, di (2-ethylhexyl) phthalate if intravenous fat emulsion (IVFE) is a component of the nutrient regimen.
9. Administration sets for IVFE infusions separate from PN formulations shall be discarded after use or if the IVFE is infused continuously, at least every 24 hours.
10. Administration sets for total nutrient admixture (TNA) are changed every 24 hours.
11. Administration sets for 2-in-1 formulations are changed every 72 hours.
12. PN is to be administered via an infusion pump having adequate protection from 'free flow' and reliable, audible alarms.
13. Medical devices for PN administration should be used that minimize risk of needle-stick injuries and exposure to blood-borne pathogens.
14. Prior to PN administration, the patient's identity is verified and the PN label is reviewed for accuracy and expiration dates.
15. Visually inspect each PN prior to administration, do not infuse the PN formulation if visual changes or precipitates are apparent.
16. The PN infusion shall be completed within 24 hours of initiating the infusion.
17. IVFE infused separately from PN formulations shall be completed within 12 hours of entry into the original container.
18. The patient receiving PN should be monitored to determine the efficacy of the PN therapy; detect and prevent complications; evaluate changes in clinical conditions; and document clinical outcomes.
19. A policy and procedure should be in place to deal with the use of PN formulations prepared by an outside facility.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are supported by a review of the literature as well as results from the 2003 American Society for Parenteral and Enteral Nutrition Survey.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Optimal, safe administration of parenteral nutrition

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Practice Guidelines for Safe Practices for Parenteral Nutrition are based upon general conclusions of health professionals who, in developing such guidelines, have balanced potential benefits to be derived from a particular mode of providing parenteral nutrition feeding formulations. The underlying judgment regarding the propriety for any specific practice guideline or procedure shall be made by the attending health professional in light of all the circumstances presented by the individual patient and the needs and resources particular to the locality. These guidelines are not a substitute for the exercise of such judgment by the health professional, but rather are a tool to be used by the health professional in the exercise of such judgment. These guidelines are voluntary and should not be deemed inclusive of all proper methods of care or exclusive of methods of care reasonably directed toward obtaining the same result.
- Unfortunately, there is little, if any, published evidence to support good practices in the area of parenteral nutrition ordering and administration. Although data from randomized clinical trials of nutrition support are ideal for developing clinical practice guidelines, this type of information is not widely available. Several factors inherently limit the use of prospective randomized clinical trials in the evaluation of nutrition support. Those most likely to benefit from the treatment (e.g., severely malnourished patients) cannot be randomized to an unfed control group due to ethical dilemmas. Other limitations include outcome results influenced by clinical variables independent of nutrition support and inability to recruit large numbers of eligible individuals from 1 medical center, contributing to the enrollment of marginal candidates for nutrition support.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Resources

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

End of Life Care
Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Mirtallo J, Canada T, Johnson D, Kumpf V, Petersen C, Sacks G, Seres D, Guenter P, Task Force for the Revision of Safe Practices for Parenteral Nutrition. Parenteral nutrition administration. In: Safe practices for parenteral nutrition. JPEN J Parenter Enteral Nutr 2004 Nov-Dec;28(6):S65-70. [32 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Dec

GUIDELINE DEVELOPER(S)

American Society for Parenteral and Enteral Nutrition - Professional Association

SOURCE(S) OF FUNDING

American Society for Parenteral and Enteral Nutrition

GUIDELINE COMMITTEE

Task Force for the Revision of Safe Practices for Parenteral Nutrition

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force Members: Jay Mirtallo, MS, RPh, BCNSP, Chair; Todd Canada, PharmD, BCNSP; Deborah Johnson, MS, RN; Vanessa Kumpf, PharmD, BCNSP; Craig Petersen, RD, CNSD; Gordon Sacks, PharmD, BCNSP; David Seres, MD, CNSP; Peggi Guenter, PhD, RN, CNSN

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available to subscribers of the American Society for Parenteral and Enteral Nutrition (ASPEN) Guideline and Standards Library.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 727-4567.

AVAILABILITY OF COMPANION DOCUMENTS

The following background documents are available:

- Preface. Safe practices for parenteral nutrition. 4 p. 2004 Dec.
- Introduction. Safe practices for parenteral nutrition. 2 p. 2004 Dec.

The following documents are also available:

- Standards of practice. Definition of terms, style, and conventions used in A.S.P.E.N. guidelines and standards. 2005 Apr. 5 p.
- Parenteral nutrition safe practices: results of the 2003 American Society for Parenteral and Enteral Nutrition Survey. 2006 Jun. 7 p.
- American Society for Parenteral and Enteral Nutrition (ASPEN), Parenteral Nutrition Standardization Task Force: Kochevar M, Guenter P, Holcombe B, Malone A, Mirtallo J. ASPEN statement on parenteral nutrition standardization. J Parenter Enteral Nutr 2007;31(5):441-8.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 727-4567.

A CD-ROM tutorial: Writing PN orders is available for purchase from the American Society for Parenteral and Enteral Nutrition Web site.

PATIENT RESOURCES

The following is available:

- The A.S.P.E.N. nutrition support patient education manual. Silver Spring (MD): American Society for Parenteral and Enteral Nutrition, 2007. 427 p.

Print copies: Available for purchase from the American Society for Parenteral and Enteral Nutrition Web site.

advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI Institute on July 8, 2008. The information was verified by the guideline developer on July 30, 2008.

COPYRIGHT STATEMENT

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

Date Modified: 10/6/2008